Method B // If the Envoy-S is NOT associated with a system in Installer Toolkit

A) Log into Enlighten and click **Add a New System** from the dashboard.

B) Enter the System, Installer, Owner, and Location information.

C) Enter the Envoy serial number.

D) Click **Save** to submit the form.

E) After the microinverters have reported to Enlighten, open Array Builder from the activation form, and create the virtual array, using the installation map as your reference.

Safety and Advisory Symbols

⚠	**DANGER**: This indicates a hazardous situation, which if not avoided, will result in death or serious injury.
⚠	**WARNING**: This indicates a situation where failure to follow instructions may be a safety hazard or cause equipment malfunction. Use extreme caution and follow instructions carefully.
✓	**NOTE**: This indicates information particularly important for optimal system operation. Follow instructions carefully.

Safety Instructions

⚠	**DANGER**: Risk of electric shock. Risk of fire. Do not attempt to repair the Envoy-S; it contains no user-serviceable parts. Tampering with or opening the Envoy-S will void the warranty. Warranty void if cover removed. If the Envoy-S fails, contact Enphase Customer Support for assistance (support@enphaseenergy.com).
⚠	**DANGER:** Risk of electrocution! Do not install CTs when current flowing in the sensed circuit. Do not energize the sensed circuit until the CT wires are installed in the terminal block.
⚠	**DANGER**: Risk of electric shock. Do not use Enphase equipment in a manner not specified by the manufacturer. Doing so may cause death or injury to persons, or damage to equipment.
⚠	**DANGER**: Risk of electric shock. Be aware that installation of this equipment includes risk of electric shock. If you wire the Envoy-S at the subpanel, always de-energize the subpanel before beginning.
⚠	**DANGER**: Risk of electric shock. Risk of fire. Only qualified personnel should troubleshoot, install, or replace the Envoy-S.
⚠	**DANGER**: Risk of electric shock. Risk of fire. Do not wire unused terminals or terminal blocks on the Envoy-S.
⚠	**WARNING**: Before installing or using the Envoy-S, read all instructions and cautionary markings in the technical description and on the Envoy-S.
⚠	**WARNING**: Risk of equipment damage. If installing the Envoy-S in an enclosure, choose area for installation where ambient temperature does not exceed 46° C (115° F).
✓	**NOTE**: Perform all electrical installations in accordance with all local electrical codes and the National Electrical Code (NEC), ANSI/NFPA 70.
✓	**NOTE**: To ensure optimal reliability and to meet warranty requirements, the Enphase Envoy-S must be installed according to the instructions in this manual.

FCC Statement: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, you are encouraged to try to correct the interference by one or more of the following measures:
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance may void the user's authority to operate the equipment.

This Class B digital apparatus complies with Industry Canada ICES-003.

140-00074-02

Troubleshooting

a LED overview

LED	State	Description
All	Flashing amber in unison	The Envoy-S is booting up
	Flashing green sequentially	Software upgrade in progress
Network communications	Solid green	Communicating with Enlighten
	Flashing green	WPS connection in progress or the Envoy-S is attempting to connect to Enlighten
	Solid amber	Local network connection only
	Off	No network connection
AP mode	Solid green	AP mode enabled: Envoy Wi-Fi network available
	Off	AP mode disabled: Envoy Wi-Fi network unavailable
Power production	Solid green	All communicating microinverters are producing
	Flashing green	Microinverter upgrade in progress
	Solid Amber	At least one microinverter is not producing
	Off	Microinverters are not communicating (low light or night time)
Microinverter communications	Solid Green	All microinverters are communicating
	Flashing Green	Device scan in progress
	Solid Amber	At least one microinverter is not communicating
	Off	Microinverters are not communicating (low light or night time)

b Microinverter detection issues

If the Microinverter Communications LED ⇆ lights solid amber, it may be a result of low light levels. If there isn't enough sunlight to power up the microinverters, they can't communicate with the Envoy.

If there is sufficient daylight for the microinverters to power up, the issue may be that the Envoy is having difficulty communicating over the power lines. To troubleshoot this issue:

- Check the Installer Toolkit mobile app to see which microinverters are not communicating.
- Check that the circuit breaker(s) for the PV array are in the "ON" position.
- Verify that the PV modules are connected to the microinverters.
- Verify the PV module DC voltage is within the allowable range for the microinverter.

c Power production issues

If the Power Production LED ⚡ lights solid amber, check the Installer Toolkit mobile app to see which microinverters are not producing:

- If none of the microinverters are producing power, there may be a grid or wiring issue. First, verify that there is proper input voltage and frequency from the utility. Next, check the breaker and wiring, starting at the load center.
- If all of the non-productive microinverters are on the same branch, check the breaker and wiring starting at the junction box for the affected branch.
- If only one or scattered microinverters are not producing power, first check to see that the AC connectors are fully seated in the Engage Cable connectors. Next, check that each module is providing the required startup voltage for the microinverter (22V). A PV module that is failing or that is undersized may not generate enough power for AC conversion.

d Internet connection issues

If you are using Wi-Fi and the Network Communications LED ☁ remains off:

- The WPS connection window may have timed out. Retry the connection steps.
- Make sure that the broadband router is operational by checking that other devices at the site can access the network.
- Be aware that metal enclosures or obstructions impede wireless communication.
- If you cannot see your router or access point in the list on the Envoy, or cannot maintain a connection, it may be necessary to add a wireless repeater to extend the network range.

If you are using Wi-Fi and the Network Communications LED lights solid amber, make sure that the broadband router is connected to the Internet by checking that other devices at the site can access the Internet.

If you are using the Enphase Mobile Connect modem and the Network Communications LED remains off or lights solid amber, see Troubleshooting in the *Enphase Mobile Connect Installation Guide*.

For any connection method, you can troubleshoot network issues with the Installer Toolkit mobile app by tapping the **Network** button, then **Diagnostic Tools**.

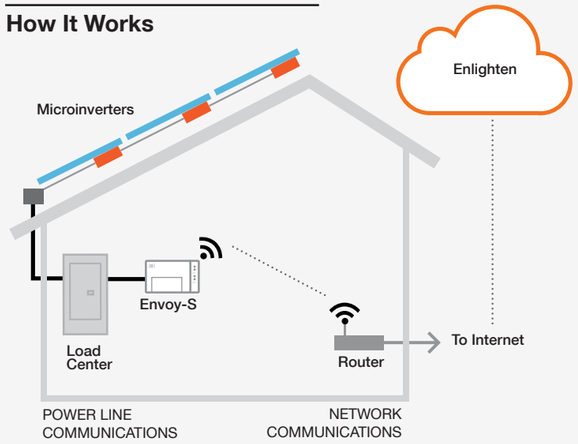
If you replace the broadband router, configure the Envoy Wi-Fi settings for the new Wireless Network Name (SSID) and password.

QUICK **INSTALL** GUIDE (Model ENV-S-AM1-120)

Installing the **Enphase Envoy-S Metered**

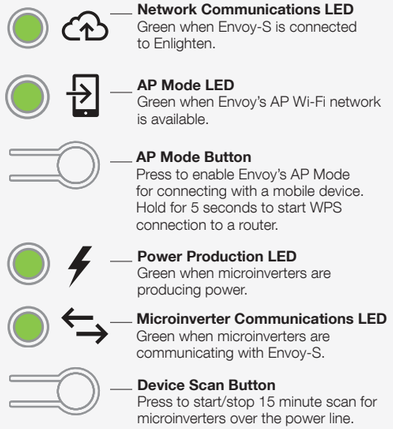
To install the Enphase® Envoy-S Standard, read and follow all warnings and instructions in this Guide and in the *Enphase® Envoy-S Installation and Operation Manual* at: http://www.enphase.com/support. Safety warnings are listed on the back of this guide.

How It Works



Envoy-S Display and Controls

Track system installation progress with the **Enphase Installer Toolkit** mobile app. The LEDs on the Envoy-S are solid green when a function is enabled or performing as expected, flashing when an operation is in progress, or solid amber when troubleshooting with Installer Toolkit is required. For a legend of all LED states, see *Troubleshooting* a.



Network Communications LED
Green when Envoy-S is connected to Enlighten.

AP Mode LED
Green when Envoy's AP Wi-Fi network is available.

AP Mode Button
Press to enable Envoy's AP Mode for connecting with a mobile device. Hold for 5 seconds to start WPS connection to a router.

Power Production LED
Green when microinverters are producing power.

Microinverter Communications LED
Green when microinverters are communicating with Envoy-S.

Device Scan Button
Press to start/stop 15 minute scan for microinverters over the power line.



Enphase Installer Toolkit mobile app

PREPARATION

A) Download the Enphase Installer Toolkit mobile app and open it to log in to your Enlighten account. With this app, you can connect to the Envoy-S to track system installation progress. To download, go to http://enphase.com/toolkit or scan the QR code at right.

B) Check the box for the following items:
- Enphase Envoy-S Metered
- Production metering current transformer (CT)
- Length of DIN rail for mounting
- Ferrite bead to attach to your Ethernet Cable, if used

C) You must install the Envoy-S Metered in a non-metallic, NRTL Certified NEMA type 3R (or better) enclosure with conduit attachment. Do not drill holes on the top of the enclosure or anywhere that allows moisture ingress.

D) Make sure you have the following optional items, if needed:
- Enphase Mobile Connect modem (order CELLMODEM-01)
- Ethernet over power line communication (PLC) bridge with Ethernet cables (order EPLC-01)
- Two (2) consumption metering split-core CTs (order CT-200-SPLIT)

E) Decide how to connect the Envoy-S to the Internet: Wi-Fi, an Enphase Mobile Connect modem, or Ethernet.

F) Install the PV modules and microinverters as directed by the installation manuals.

G) Create a paper installation map to record microinverter serial numbers and positions in the array.
- Peel the removable serial number label from each microinverter and affix it to the respective location on the paper installation map.
- Peel the removable label from the bottom of the Envoy-S and affix it to the paper installation map.
- Always keep a copy of the installation map for your records and to upload to Enlighten later.

Note: If needed, you can find an installation map at the back of any *Enphase Microinverter Quick Install Guide.*

INSTALLATION

1 Choose a location for the Envoy-S

A) Find a spot near the main load center or PCC (point of common coupling).

B) Install the Envoy-S inside a non-metallic, NRTL Certified NEMA type 3R (or better) enclosure with conduit attachment.

C) Mount the Envoy horizontally using the included DIN rail.

2 Wire the Envoy-S for Power and Metering

The Envoy-S uses terminal blocks for power and metering connections. One solid-core current transformer (CT) is provided for revenue grade production metering. Two optional split-core CTs can be used to provide consumption metering. You must create a protected route using conduit for the CT wires from the main load center to the Envoy-S. If you need to extend the wires, refer to the *Enphase Envoy-S Installation and Operation Manual* at: http://www.enphase.com/support.

Note: Because of variance in load center design and main power feed, there may not always be enough space to install consumption metering CTs.

A) Wire the Envoy-S for **power**

- Use a 15 A maximum circuit breaker for the supply wiring.
- Make sure supply wiring is 14 AWG rated at 75 degrees C or better
- Locate the screw on the left side of the terminal block door, and loosen it with a screwdriver to unlock the door.
- Flip open the terminal block door and wire the line and neutral conductors as shown. (Connect Line 1 to A, Line 2 to B, and Neutral to N.) Tighten to 5 in-lbs.

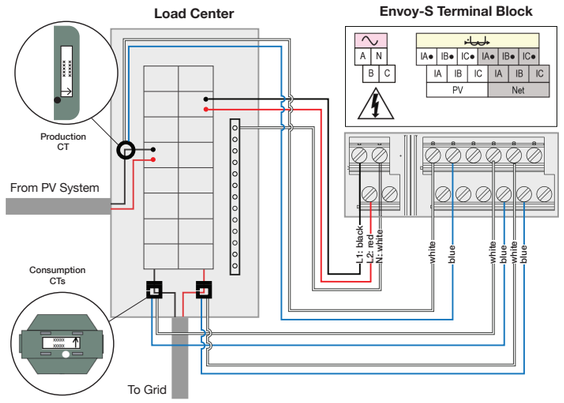
DANGER! Risk of electric shock. Always de-energize the load center before beginning wiring.

B) Install the CT for **production** metering

- Use **only** the CT that came with the Envoy-S. It is marked with the same serial number as the Envoy-S.
- Locate the arrow on the CT label.
- Install the CT on Line 1 (matching Envoy's "A" voltage terminal) of the solar production circuit with the arrow pointing towards the breakers.
- Connect the white wire to the "IA•" terminal. Tighten to 5 in-lbs.
- Connect the blue wire to the "IB•" terminal. Tighten to 5 in-lbs

C) Install CTs for **consumption** metering (optional)

- Make sure that the main load center wires are de-energized until you have secured the CT wires in the terminal blocks.
- Before running the CT wires through the conduit, use colored tape to mark one of the CTs and the free end of its wires.
- For the marked CT wires, connect the white wire to "IA•" and the blue wire to "IA".
- For the unmarked CT wires, connect the white wire to "IB•" and the blue wire to "IB".
- Install the marked CT on the load center feed wire Line 1 (matching the Envoy's "A" voltage terminal) with the CT arrow pointing toward the breakers.
- Install the unmarked CT on the load center feed wire Line 2 (matching the Envoy's "B" voltage terminal) with the CT arrow pointing toward the breakers.
- Tighten all connections to 5 in-lbs.



DANGER! Risk of electrocution! Do not install CTs when current is flowing in the sensed circuit. Do not energize the sensed circuit until the CT wires are installed in the terminal block.

Note: When installing CTs, it is important to match CT and sense voltage phases. Be sure to consistently identify the two AC lines at three points: the main load center feed, the Envoy, and the solar production circuit breaker. Wire colors (typically black and red) may not always consistently identify Lines 1 and 2. If in doubt, use a multimeter to check.

3 Energize the Envoy-S

A) Close the terminal block door, and secure it with the screw.

B) Turn on the circuit feeding the Envoy-S.

C) All four LEDs flash amber during boot up (approximately 3 minutes). When boot up is complete, the Microinverter Communications LED lights solid amber, indicating that microinverters are not yet detected.

4 Detect Microinverters

Use one of the following methods to detect microinverters.

Method A // Provision microinverters with Installer Toolkit

Use the Installer Toolkit mobile app to configure the Envoy-S with the serial numbers of the installed microinverters.

A) Launch Installer Toolkit and tap **View Systems.**

B) Select the system you are working with, or tap **[+]** to add a system.

C) Connect to the Envoy-S with your mobile device as described in the note on top of the next page.

D) Return to Installer Toolkit. If the serial number for the Envoy-S you are installing is not displayed on the System Overview screen, tap the **[+]** next to the word "Envoys". When the app displays the serial number of the Envoy-S, tap it to add it to the system.

E) Create the arrays and scan the serial numbers from the installation map as instructed by the *Installer Toolkit Operation Manual* at http://www.enphase.com/support.

F) Tap the **Connect** button. This provisions the scanned microinverters on the Envoy-S.

G) When prompted, confirm the number of microinverters that you installed.

The Microinverter Communications LED lights solid green if all of the provisioned devices are communicating or solid amber if any devices are not communicating.

Method B // Discover microinverters with Installer Toolkit

Use the Installer Toolkit mobile app to set the number of microinverters the Envoy-S should search for on the power line.

A) Connect to the Envoy-S with your mobile device as described in the note on top of the next page.

B) Launch Installer Toolkit and tap **Connect to an Envoy.**

C) When prompted, enter the number of microinverters that you installed.

D) When prompted to start a device scan, tap **OK**.

The Microinverter Communications LED flashes green while scanning. It lights solid green when all of the microinverters you installed are communicating or solid amber if any devices are not communicating.

Note: Connecting to Envoy-S with a Mobile Device

The Envoy's AP (Access Point) Wi-Fi network allows you to connect your mobile device to the Envoy-S. The AP Mode LED lights solid green when the network is available.

- On the Envoy-S, if the AP Mode LED is not lit, press the AP Mode button.
- On your mobile device, go to Settings and join the Wi-Fi network "Envoy_nnnnnn" (where "nnnnnn" represents the final six digits of the Envoy serial number).

Method C // Discover microinverters with the Envoy-S

If you are not using the Installer Toolkit app, press the Device Scan button on the Envoy-S. With this method, the Envoy searches the power line for 15 minutes, but does not know how many microinverters it should discover.

The Microinverter Communications LED flashes green for 15 minutes while scanning. At the end of the scan, it lights solid green if at least one microinverter was discovered or solid amber if no microinverters were discovered (or if any discovered microinverter stops communicating).

With all methods

If the Microinverter Communications LED remains solid amber, see *Troubleshooting*.

5 Verify System Configuration

While still connected to the Envoy-S with Installer Toolkit, check the Envoy Overview screen for the following:

A) Confirm that the expected number of devices are detected, communicating and producing power.

B) If your system is in Hawaii or in another region that does not use the **Factory-Installed Grid Profile**, tap the **Grid Profile** row on the Envoy Overview screen to select and apply a grid profile to the microinverters. On the Envoy Overview screen, check that the new profile is set on all the microinverters. This may take up to 5 minutes.

C) Tap the **Meters** button and check that Production Metering is enabled.

D) If you installed consumption metering CTs, tap the **>** to the right of **Consumption Meter.**

- If the consumption CTs are on a circuit that solar production flows through, leave the type set to **Net,** If not change the type to **Total.**
- Tap **Enable Consumption Meter.**

E) Return to the Envoy Overview screen and verify the meter reading(s).

If you used Installer Toolkit to detect microinverters, the Power Production LED lights solid green when all expected microinverters are producing power. If you did not use Installer Toolkit, it lights solid green if all communicating microinverters are producing power. It flashes green when microinverters are upgrading. Check Installer Toolkit for production status details. If the Power Production LED remains solid amber, see *Troubleshooting*.

6 Connect to Enlighten

WARNING: Do not remove power from the Envoy-S if the LEDs are flashing green. This indicates that a software upgrade is in progress.

This section describes using the Envoy-S integrated Wi-Fi or the Mobile Connect modem. For information about using Ethernet PLC bridges, refer to the *Enphase Envoy-S Installation and Operation Manual* at: http://www.enphase.com/support.

Method A // Integrated Wi-Fi

Requires a wireless router with an Internet connection.

A) On the Envoy-S, verify that no Ethernet cable is plugged into the RJ45 port.

B) If the router supports WPS, press and hold the WPS button on the wireless router for a few seconds. On most routers, a WPS indicator begins flashing.



C) If you are using the Installer Toolkit mobile app, tap the **Network** button, tap **Wi-Fi,** and then tap your network from the list of available networks. If the wireless router does not support WPS, you may be prompted to enter a password.

If you are not using the Installer Toolkit mobile app, initiate a WPS connection by pressing and holding the Envoy-S AP Mode button for 5 seconds.

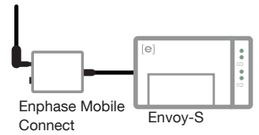
The Network Communications LED begins flashing green. Within three minutes the Network Communications LED lights solid green, indicating a successful connection to Enlighten. If the Network Communications LED remains off or lights solid amber, see *Troubleshooting*.

Method B // Enphase Mobile Connect Modem
(Order CELLMODEM-01 separately)

A) Connect the antenna to the antenna connector (marked CELL) on the modem.

B) Mount the modem as described in the *Enphase Mobile Connect Installation Guide*.

C) Connect the micro-USB cable to the modem and connect the other end of the cable to the Envoy-S. If receiving power from the Envoy-S, the modem power LED lights.



Within three minutes the Network Communications LED lights solid green, indicating a successful connection to Enlighten. If the Network Communications LED remains off or lights solid amber, see Troubleshooting in the *Enphase Mobile Connect Installation Guide*.

7 Send System Summary Report

When you have completed your system setup, you can generate and email a summary report.

A) From Installer Toolkit, tap **Done** in the upper-right corner of the screen to disconnect from the Envoy. Installer Toolkit will ask if you want to view a summary report.

B) Tap **View Report.** The report displays Envoy and system information with a list of microinverter serial numbers, their last power reports, and information about the grid profile applied to the microinverters.

C) Tap to email the report to your office as a record of successful system installation or to the utility for evidence of grid profile settings.

ACTIVATE MONITORING

Register the Envoy-S in Enlighten (https://enlighten.enphaseenergy.com).

Method A // If the Envoy-S is associated with a system in Installer Toolkit

A) On your mobile device, go to Settings and disconnect from the Envoy's Wi-Fi network.

B) Return to the Installer Toolkit app and tap the **Sync** button on the System Overview screen.

C) When you have access to a computer, log in to Enlighten and select the system name from the Activation List on the dashboard.

D) From the activation form, open Array Builder.

If you used Installer Toolkit to build arrays and scan microinverter serial numbers, the array(s) are built—make any necessary adjustments in Array Builder.

If you did NOT use Installer Toolkit to build arrays and scan microinverter serial numbers, create the virtual array in Array Builder using the installation map as your reference. (You may need to wait if the microinverters have not yet reported to Enlighten.)